Networks for Knowledge Creation: Interorganizational Collaborations for Sustainability

Dr Suzanne Benn

School of Management

University of Technology, Sydney

NSW 2007
Email: suzanne.benn@uts.edu.au
Phone: 61 29514 3059
Fax: 61 29514 3615

Distinguished Professor Dexter Dunphy

School of Management

University of Technology, Sydney

NSW 2007 Australia

Email: dexter.dunphy@uts.edu.au

Phone: 61 9514 3060

Fax: 61 9514 3615

Andrew Martin
Barrister-at-law, Doctoral Student
Australian Centre for Environmental Law
University of Sydney
Email: amartin1@bigpond.net.au
Phone: 61 98183850
Fax: 61 95143615

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Abstract

This paper reports on the results of a study on collaboration between corporations, local communities and other stakeholders. On evidence from this study, we argue that networked community-based organisations are the key element in developing successful corporate relationships with other stakeholders in terms of knowledge creation for environmental sustainability. We relate this success to the embeddedness, depth of involvement and the shared sense of purpose enabled by community-based networks. We identify important skills which facilitate this new knowledge becoming incorporated into ongoing, reflexive management practices needed in the arena of 'subpolitics'. Finally, we challenge the assumption that decentralised forms of decision-making allow for democratisation of environmental decision-making and knowledge creation.

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Introduction

This paper reports on the results of a study on collaboration between corporations, local communities and other stakeholders. The study aimed to explore the features of collaborative practices that enable the reflexive creation of new knowledge and the skills required to realise this knowledge into reflexive management practices.

The importance of this area of research has been highlighted at both the level of policy and theory. In policy areas it has been recognised that a particular challenge of sustainability is the complex and interrelated nature of ecological ties. As a result, transforming the way we manage our land water, mineral and energy resources can seldom be the responsibility of a single stakeholder; it may involve multiple stakeholders with different rationalities, different understandings of sustainability and different management and governance expectations (Australian Agricultural Assessment 2001; Environment Australia and Agriculture, Fisheries, Forestry – Australia 2002).

Leading business organisations in Australia have recently called for a multiple stakeholder approach to repair extensive environmental degradation caused by unsustainable agricultural practices (Business Leaders Roundtable 2001). In these circumstances, effective change for sustainability

requires mobilising a wide range of organisational and community resources. At the level of both state and federal policy it has been decided that the best courses of action will be based upon stakeholder relations and that these will be built upon self-regulatory arrangements and partnerships between industry groups, agribusinesses, research and development corporations and government.[1] Yet, such partnerships are highly variable and it is not known which are the best models for practice. Research is needed to address this fundamental question.

A number of theorists from the varying disciplinary areas of environmental law and policy, natural resource management and environmental sociology argue that reflexive management, on the part of institutions and individuals, is crucial to implementing change for sustainability (Beck 1992; Bates 2003; Dovers 2003). In the sense that 'knowledge forces decisions and opens up contexts for action' (Beck 1999: 110) knowledge creation is a factor underpinning reflexive or adaptive management. We aim to explore opportunities to develop new and reflexive relationships at the local, rural or regional level of what Beck has termed the 'sub-political' arena: that forum for decision-making operates outside the accepted sphere of representative politics (Beck 1995). 'Decentralised centres of sub-politics', it is claimed, comprising media publics, employers organizations, individual actors, community groups, government and corporate bodies, are challenging the authority of traditional institutions of industrial society (Beck 1995: 73). 'Sub-political' forms of multiple stakeholder arrangements have collaborative practices which are often temporary, shifting and informal, they incorporate both individual members of the community and individual organisations, they go beyond ' formal responsibilities and hierarchies' (Beck 1997: 98) and they have detraditionalising effects (Beck 1995; Beck 1999; Beck, Giddens and Lash 1994). They take the form of citizens' committees, task forces, and include a wide range of collaborative arrangements for decision-making between corporations and local and regional bodies and communities.

In the theory of 'sub-politics', the 're-entry' of the individual is a key aspect, as the individual actor (whether organization or single individual) is 'required to plan, understand, design or act – or to suffer the consequences which will be considered self-inflicted in case of failure' (Beck 1997: 96). The theorized reflexivity of the 'sub-political' arena of politics comes back to this: a renewal of political subjectivity and a perceived need of the individual to engage in ecological decision-making in particular. In summary, 'sub-politics' can be distinguished from traditional forms of politics in that:

> a) agents outside the political or corporatist system are also allowed to appear on the stage of social design (this group includes professional and occupational groups, the technical intelligentsia in companies, research institutions and management, skilled workers, citizens' initiatives, the public sphere and so on) and

[1] See, for example, Australian Agricultural Assessment 2001.

b) not only social and collective agents, but individuals as well compete with the latter and each other for the emerging power to shape politics' (Beck 1997: 103).

The key question in relation to our overall research question is how new knowledge is generated in these 'sub-political' arrangements.

Another relevant body of theory concerns the cognitive dimension of bridging social capital, that form of external social capital (Adler and Kwon 2002) which is developed through shared understandings and is dependent on the development of shared narratives and language (Nahapiet and Ghoshal 1998). How does this bridging social capital relate to the generation of human capital in the form of new knowledge and actionable skills concerning sustainability?

Other areas of the organisational studies literature are also pertinent. Multiple stakeholder arrangements can be strongly influenced by power relations (Benn and Onyx 2003; Gray 2000). As well, Rondinelli and London's (2003) have argued that trusting interorganisational relations which indicate a willingness to share knowledge require mutually agreed governance mechanisms and shared values. Earlier research has indicated that negotiated, flexible and decentralized arrangements allow more opportunities for participation by more stakeholders and offer more creative solutions (Chua and Clegg quoted in Hardy 1994). More recent work by Hardy, Phillip and Lawrence (2003: 326) has shown that: 'the more collaborative ties the organization has, and the greater the diversity of its partners, the more successful it will be at generating new knowledge'. This research indicates that collaborations associated with both high levels of embeddedness (interactions with third parties, representation and multidirectional information flows) and involvement (deep interactions, partnerships and bi-directional information flows) are associated with knowledge creation. Austin's (2000) influential work has argued that has argued that collaborative relationships can be analysed according to a collaborative spectrum, ranging from philanthropic, through transactional to integrative. We see links between Hardy et als' notion of 'involvement' and Austin's classificatory scale and suggest that Austin's 'integrative' category can be understood as 'involvement'. Hence we propose that if new knowledge about sustainability is to be reflexively created within 'sub-political 'forms of multiple stakeholder arrangements, then the relationships must be both embedded and involved.

Methodology

This study is an empirical exploration of interorganisational arrangements for sustainability in an Australian context. For the purposes of this study, we look to knowledge creation for sustainability as evidenced by the development of new sustainability practices - taken to be those which specifically relate to the sustainable management of natural resources.

Choosing the Australian community-based network organisation, Landcare, as a research site is a key aspect of the methodology. Landcare is chosen firstly because of its structure. It is a networked,

community-based organisation, committed to sustainable development and community awareness raising about the need for changed practices of natural resource management. In global terms Landcare is a unique organisation comprising some 4500 autonomous groups organised in networks across Australia. Local groups are arranged in local networks and local networks in regional networks. This organisation provides many examples of interorganisational arrangements. Governmental bodies are linked into the networks at both local and regional levels in order to provide funding and professional advice. The organisation is also linked with approximately 40 major corporations through sponsoring arrangements. Many of these collaborative arrangements are organised at the national level by the corporate organisation, Landcare Australia Limited. Other corporate links are to regional networks and many local groups are involved in support relationships with local business organisations. It seems then, that Landcare enables 'sub-political' relationships and in the diverse ways it relates to other stakeholders may give us an indication of the requirements for knowledge creation.

A second reason for choosing this research site is that the considerable research already conducted on Landcare gives us an overall organisational picture, and some idea of its power relations, limitations and achievements in terms of sustainability outcomes. We acknowledge for instance the earlier research of Sobels et al (2003) which recognised Landcare groups as a source of bonding social capital and the relationship between this dimension of sustainability and environmental sustainability. We note that Landcare has been variously described as: ecologically irrational (Buchy and Race 2001); a source of greenwash for corporations (Lockie 1997); a 'neo-liberal' program which exploits the volunteerist ethic (Byron and Curtis 2001); an interorganizational arrangement which tends to separate into opposing discourses of bureaucratic and local interests (Benn and Onyx 2003) or achieving progress towards the triple bottom line as an organization (Nicholson and Knight 2003). To our knowledge the concept of the relationship between the collaborative ties of bridging social capital and human capital in the form of new knowledge and skills has not been researched

The third reason for the choice of Landcare is access. The authors are engaged in Landcare activities at a grass roots level and can thus undertake participant observation research. One of the authors has already conducted research on the organisation using this methodology. In an earlier project concerning the Australian community-based network organisation, Landcare (Benn and Onyx 2003), interviews were conducted with a number of corporations, Landcare community group members and local Landcare coordinators in two states of Australia. Some data from this research is included in Tables 2.1 and 2.2. Information on Landcare was also obtained from Landcare websites: Hunter Region Landcare Network http://www.landcarensw.org/Hunter.htm; http://www.landcareaustralia.com.au/; http://www.landcarensw.org/ and from interviews and personal communication with Landcare personnel.

For this current study, six corporations were selected for intensive study. All have some form of collaborative or consultative relationship with their local community and also have a relationship with Landcare, but of varying types. All are from sectors which have considerable environmental impact – one chemicals company (Trinature), three from the resources and mining sector (Ravensworth Operations, Centennial Coal -Newstan and Mandalong mines, and Rio Tinto) and two from the water utilities sector (Westernport Water and Hunter Water Corporation). Each of these organisations is situated in rural or regional areas of Australia. Only two were researched in the previous study (Rio Tinto and Westernport Water). The water utilities corporations are government owned corporations. The corporations are Trinature, Centennial Coal (Newstan and Mandalong Mines), Rio Tinto, Ravensworth Operations, Westernport Water and Hunter Water Corporation. In each case, in depth interviews were carried out with corporate representatives and with other stakeholders such as community group members, with Landcare group members, with local activists, and with other stakeholders in the arrangements such as Landcare Coordinators, who are usually part-funded by local or state governments. Each interview focussed on the perceived key multiple stakeholder arrangement for sustainability that the interviewee organisation was involved with.

In selecting the analytical categories with which to analyse the results we utilised the conclusions of other researchers discussed above Hardy et al (2003) and Rondinelli and London (2003). From these writers we concluded the key qualities of interorganisational relationships which enable the generation of new knowledge would be:

- embeddedness (measured in Hardy et al's terms of interactions with third parties and multidirectional information flows);
- involvement (measured in Hardy et al's terms by depth of interaction).
- and shared sense of relevance and purpose (Dovers 1989; Rondinelli and London 2003).[2]

Findings

Trends within the 'sub-political' arena of Landcare

Our previous work has indicated that Landcare is an interorganizational arrangement which reflects the distinct discourses of bureaucratic and local interests (Benn and Onyx 2003). For instance in some ways Landcare appears to operate as a 'bottom-up' organization. According to one Landcare community network representative:

[2] We have not included all the dimensions used by Hardy et al to characterise embeddedness and involvement as our research target is multiple stakeholder relationships and considerations such as representation do not apply as strongly as they can in a simpler corporate-NGO collaboration. We note that low involvement is associated by Hardy et al (2003) with uni-directional information flows.

'to the extent that Landcare develops "policy" objectives within a network, the processes for doing so are specifically designed to prevent a single influence group from dominating the policy-making process. Our policies are devised in simultaneous "workshops" on broad issues such as weeds, soil erosion, salinity etc at annual or biennial forums at each level. A politically motivated group could only ever hope to dominate policy in one area at one level at any time. This is a deliberate procedure aimed at maximising consensus, eliminating politically motivated takeover and preserving autonomy'.[3]

But an important feature of the Landcare movement, its cadre of employed coordinators, very much reflects the extent to which it can provide bridges across the local and bureaucratic boundaries. The coordinators are paid by the groups themselves, by sponsors, by government bodies at every level or by a combination from those different sources. While they have obligations to report to the appropriate funding bodies, their principal task is to advance the objectives of the autonomous groups in their respective areas in co-ordination with efforts at regional, state and national levels. Most coordinators have skills in natural resources management or farming, but the criteria for appointment are not rigid, and formal qualifications are not necessarily preferred above experience.

In earlier work we reported on power struggles between the local and bureaucratic domains (Benn and Onyx 2003) and on the attempt by the bureaucratic arena to colonise the local aspect of Landcare. But since then feedback from Landcare groups as a result of the National Review of Landcare (August 2003) has driven the Federal Government to lend support to the local coordinators and offered to increase their numbers (e.g. three Regional Coordinators in the Hunter/Central region as opposed to one).

Another observed trend relevant to our research interest is the apparently increasing diversity of Landcare. The heterogeneous nature of groups seems to emerge in response to a wide range of problems. Groups have emerged as a result of an immediate threat such as 'the creeks running black or even running backwards'[4], or as a result of evident salinity problems or to a perceived threat such as a development proposal for a motor-bike raceway. Landcare provides both local and more general information in diverse ways – from farm visits to expert talks. There is a diverse range of Landcare Groups based on Tidy Towns, Farm Tree Groups, Schools and Scouts, all geared to respond to local problems.

Discussion

In Tables 1.1-1.6, we have classified the six companies and their multiple stakeholder relationships for sustainability according to categories suggested by the writers referred to above. In Tables 2.1

[3] Personal communication, Singleton Landcare Network representative, Singleton, December 2003
[4] Interview with community member, Lake Macquarie Landcare Resource Centre, November 2003.

and 2.2, we set out typical statements from interviews with the corporate representatives and members of the Landcare organisation which illustrate the general themes concerning factors facilitating or impeding the creation of knowledge for sustainability.

Analysing the relationships: Centennial Coal and Landcare

In examining Tables 1.1-1.6 we see the most striking differences between Centennial Coal Newstan (CCN) and Centennial Coal Mandalong (CCM). These are two mines operated by the same company with the same Group Environmental Manager. It is very noticeable that these different 'sub-political' arrangements of CCN and CCM create very different outcomes in terms of new knowledge emerging from the relationship. One evident causation is in the degree of embeddedness – the Newstan Committee is interlinked with the numerous connections enabled through Landcare. In Austin's terms (2000), the Landcare organisation has an integrated relationship with CCN.

We hesitate to conclude that lack of connectivity is the only reason that the CCM is in stalemate – there may be some differences in the environmental effects from the two mines that is also influencing the outcomes. But the comparison between the two mines and their 'sub-political ' arrangements in relation to reflexive management supports Hardy et al's thesis on knowledge creation through embeddedness also highlights the importance of the community-based network in facilitating multidirectional information flows. The Landcare network's involvement in the CCN committee encourages the translation of more general corporate understandings of OHS into local understandings specific to natural resource management. It also allows for the creation of site-specific new knowledge, developed through a combining of the knowledge of the mine environmental officer's knowledge of environmental impacts on waterways and the landcarers' local natural resource management knowledge. It then enables this knowledge to flow out to encounter other information flows in government departments.

The Mandelong Committee (CCM) is an example of the 'congestion' that can result from such arrangements: according to Beck the only source of power for the individual or activist organization is congestion (Beck 1997: 107). The data here supports Beck's general contention that 'sub-political' arrangements reflect a loss of enforcement power – the stalemate results from the congestion by the individual activists of the CCM Committee (Beck 1997). With CCM Mandelong Mine there is little engagement with Landcare or other supportive community-based organizations. The result is community member 'burn-out'.

Analysing the relationships: Ravensworth Operations and Singleton Landcare Network

The Consultative Committee at Ravensworth Operations lends support to Beck's prediction that such 'sub-political' arenas would enable the empowerment of individuals (Beck 1992; Beck 1999). But this Committee is not apparently engaged in the production of new knowledge. There is sponsorship for Landcare but it is not an integrated relationship, of the kind defined by Austin

(2000), and the information flow is unidirectional. A top down corporate-driven approach hinders local knowledge and engagement. The individual community members do not have the expertise to contribute to construct new understandings concerning appropriate land rehabilitation.

Analysing the relationships: Landcare, Rio Tinto and Project Platypus

With Rio Tinto's Project Platypus we have a situation where the founding corporation facilitated the development of the multiple stakeholder arrangement. New partnerships, a high level of embeddedness and new knowledge were constructed as a result of this initiative. This relationship was only seen to be temporary – as with the other resources based companies - the embeddedness is to be short term. Compared to CCN, the knowledge of local Landcarers is not incorporated into the multidirectional flows unless incorporated into Rio Tinto's scientific understanding of sustainability. The level of involvement with Rio Tinto was only medium – low, and the relationship maintained many aspects of the transactional rather than the integrative relationship (Austin 2000). Yet the manifest new practices, which emerged from the relationship, seem to deny this low involvement and overcame the limitation to the difference in rationality. The community-based network structure of Landcare appeared to be the means by which a shared working understanding of sustainability was obtained. This shared understanding broke down some barriers between expert and local knowledge and facilitated the connection of other stakeholders into the relationship which continued even after the founding corporate had left the arrangement.

An interesting facet of the Rio Tinto Project Platypus is that Landcare facilitated the involvement of the local water authorities in the 'sub-political' decision-making. Water companies are government corporations which all demonstrate strong support for sustainability. Hunter Water Corporation and Westernport Water both incorporated collaborative practices in their decision-making, which reflected their attempt to establish an integrative relationship (Austin 2000) and shared sense of purpose with Landcare. A high level of embeddedness was facilitated with numerous connections with other organizations; a high level of new knowledge practices was the result in each case. With Hunter Water, we observed a striking difference between the operations of the Hunter Water Consultative Forum and those of the Landcare relationships more closely supervised by 'locals'. It took considerable effort on the part of Hunter Water to generate a collection of individuals who were able to contribute to any new knowledge making in the Forum context, and even that was not regarded as legitimate due to accusations of corporate capture. The 'sub-political' arena supported by Landcare showed a very different result.

Analysing the relationships: Landcare and Trinature

For Trinature there is the sense of an isolated organization, which despite the ideological convictions of its founders, remains remote from any shared discourse of sustainability. It suffers the 'taboo' (Dovers 2003) associated with a chemicals company and needs to develop more legitimacy at the

local level. Little real benefits have resulted to Trinature or to knowledge generation for sustainability in general from its relationship with Landcare. To generate new knowledge, it is not sufficient to sponsor community-based organisation - what is important is the degree of connection with the multidirectional information flows of the network. Sharing an ideological commitment to sustainability will only produce results if the multiple stakeholder relationship is a 'subpolitical' arrangement; that is, the multiple stakeholders are involved in actual decision-making rather than simply used as an information resource.

Rethinking knowledge creation factors for sustainability

A number of further generalisations can be made. Community-based network structures, which focus on local onground work and education rather than advocacy, enable the development of a shared grass roots understanding of sustainability. This shared understanding can be then built on in order to develop new practices. One of the key reasons that Landcare seems to work so well is that it offers an understanding of sustainability which is limited to sustainable natural resource management (Tables 2.1- 2.2). Sustainability discourse is a challenge for the creation of new knowledge because of its interdisciplinary nature. The resource industry associations are playing a role in driving the discourse with the aim of obtaining more legitimacy for the resources sector – but often senior managers driving the process show little understanding of the meaning given the term by the local community or even by employees at the operational levels of the corporation (Table 2.1).

Community-based network structures such as Landcare which focus on onground work can achieve major benefits in terms of increasing the number of interconnections with third parties because they are less constrained by ideology in developing and maintaining relationships. Structurally an organization such as Landcare fulfils one of the requirements of an ecocentric organization – interconnectedness (Shrivastava 1995). It also provides a structure for the dissemination of knowledge, with multiple intersecting points where new knowledge can be created. It encourages high involvement (Hardy et al 2003) for it provides structures which enable managers and coordinators at different levels to engage with community relations issues.

Evidence from comparative analysis of Landcare in the two very different consultative committees of CCN and CCM in particular, indicate the negative impacts of confrontational relationships and the current lack of capacity of government to address such issues. The key difference between a 'sub-political' arrangement in stalemate (CCM) and a successful knowledge creating arrangement (CCN) appears to be the existence of Landcare. In a situation where government appears to be effectively in retreat, the structure of a national community-based network is of great importance to the development of new practices.

Our general observations have enabled us to expand on the analytical factors we used to examine our data in terms of knowledge creation. Our results show that for new sustainability practices to be developed embeddedness and involvement were key factors. But there also had to be a shared understanding of what sustainability is, the purpose of the relationship had to be perceived as relevant by the parties involved and governance measures had to be perceived as appropriate and legitimate, the multidirectional information flow had to incorporate local knowledge and there needed to be accepted conflict management procedures associated with the 'sub-political' arrangement. We found that government involvement in the arrangements was generally limited to the local councils. A key finding was that inclusiveness was not an indication that knowledge creation would occur. Indeed, without the support of the community network, the participation of individuals did not appear to be constructive in terms of knowledge creation.

Skills enabling positive outcomes from 'sub-political' arrangements

In the context of a multiple stakeholder relationship created to resolve an environmental problem or dispute, what skills enable the positive outcomes of new knowledge creation in multi-stakeholder relationships and the actioning of this knowledge into reflexive management practices? What we are seeking to identify here is the skill base needed for managing 'sub-politics' so that novel solutions to environmental and community problems are derived and implemented.

We have seen that the conjunction of multiple stakeholders with differing interests generates problems around participation and the delivering of actionable outcomes; complex interrelationships can easily result in a situation of stalemate. We have already identified that the factors, associated with bridging social capital, that can contribute to the creation of new knowledge are: embeddedness, involvement, a shared sense of relevance, usually built on local knowledge, appropriate governance and purpose. New knowledge is more likely to emerge where these conditions exist.[5] So what behavioural skills foster the development of these characteristics? We have already established that community-based networks such as Landcare are associated with 'sub-political' arrangements and that these arrangements have the capacity to create these characteristics and generate new knowledge. We now draw from our research on Landcare to provide examples of how skills can enhance this process.

Embeddedness is a consequence of third party interactions and multidirectional information flows (Hardy et al 2003) and these are developed by having change agents who are skilled communicators and networkers who actively build trust between different stakeholders. Such change agents or community activists need the ability to identify the key interests of stakeholders and to work effectively with the political reality of their overlapping and conflicting interests. In order to avoid

the stalemate such as was observed at the Mandelong Mine, change agents need mediation, conflict resolution skills and effective informal influencing skills. They must not only perceive the interests of different stakeholder groups but also be seen as granting these interests legitimacy even if they conflict with those of other parties. These are not the typical interpersonal skills of senior managers who are often more used to organizational command and control situations but rather the kinds of skills that political activists often develop.

As mentioned, in this study we are mainly interested in the bridging social capital. However we note that where a community or an organization is high in bonding social capital, relationships can become too internally 'embedded' (Granovetter 2002) and thus less likely to develop the bridging social capital necessary to form links to external networks or actors. The result is a limited capacity for effective change management, and the generation of multiple information flows (Adler and Kwon 2002). We agree with Dovers that the two "enemies" remain always, "ad hockery" and amnesia (Dovers 2003). Embeddedness works against "ad hockery" and information exchange works against amnesia. One of the skills of the change agent would therefore have to be the recognition of the need for the fostering of shared relevance and purposefulness.

However we would add that there can also be real difficulties in creating new knowledge because bonding capital, as against bridging capital, can lead to 'group think' and 'strategic positioning' which operates by caucusing rather than genuine exchange of information and ideas. Change agents must appreciate the disadvantages of bonding social capital and actively work to create bridging relationships that bring flows of information from a variety of sources.

The key change agents must also have an ability to work with differing groups to identify the kinds of knowledge they can bring to bear on environmental problems. This knowledge is of three kinds – the first two kinds are: professional expertise such as in land regeneration or river bank restoration and also implicit local knowledge, such as understanding of seasonal rainfall variation or local soil stabilisation plants, based on experience rather than professional training. New knowledge that is effective in solving local environmental problems is often a combination of these two kinds of knowledge – the fusion of professional expertise with local understanding of particular environmental circumstances (Svendson 1998). Identifying who has what kind of information is often not easy when there is a combination of, for example, professional subject experts and local farmers – the latter, for example, may be reticent to put forward their experientially-based knowledge in the presence of so-called 'experts' (Benn and Onyx 2003).

Stimulating multi-directional information flows often requires change agents to move around amongst different stakeholder groups who may be in very different locations and to establish

[5] In the area of water management, for example, Pigram (2001) notes the importance of generating 'hydroliteracy' to combat the lack of 'hydrosolidarity' in a given catchment area where the needs of the

channels of communication between them where information flows freely around the emergent networks. Establishing a community-based network can provide the farmer with the opportunity to advance new or different ideas with confidence derived from an "alternate" body of practice or theory. In the instance of Landcare Co-ordinators working with CCN we see how such change agents can provide data from a wide range of (e.g. governmental) sources on the one hand, and independent confirmation of the validity of local experience on the other (e.g. through the shared experiences of farmers in other regions).

A third kind of knowledge is not specifically environmental but rather relevant social knowledge that enables the progression of environmental problem solving in its socio/political context. This includes for example knowledge of bureaucratic procedures for gaining governmental grants, of the identities of the informal opinion makers in the local community, of dates of municipal council meetings. Access to knowledge of this kind can be vital in maintaining the momentum of problem solving and implementation of solutions. Again, with Landcare, the coordinators are perceived as the key change agents. Landcare is but a small part of a wider shift to sustainability but it is a good model because the participants in Landcare have readily recognised the value of the role and skills of the change agent. They recognize that government policy changes supporting sustainability do not themselves make sustainability happen – there is no substitute for having skilled change agents on the ground to interpret and implement policies in the widely differing circumstances of particular communities and ecologically differentiated localities.

Involvement can grow from embeddedness as stakeholder representatives experience the growth of a new collective identity emerging from increased interaction around environmental problem solving. There is a different feel about the growing involvement that comes from establishing bridging rather than bonding social capital. The growth of involvement in bridging relationships comes primarily from experiencing the achievement of goals and from momentum in developing strategies and implementing them. There may also be involvement from deepening friendships but this is secondary to the purposive commitment to developing solutions and putting them into practice. Hence change agents need skills of generating or brokering a shared vision, a common purpose and specific agreed objectives.

The research reported on in this paper indicates that the different stakeholder groups often come with a different discourse of sustainability and change agents have to become 'multilingual' in learning the vocabulary and syntax of each distinctive discourse and being able to translate from one 'dialect' to another. At the same time they need to have a keen mind for identifying the ideological selectivity involved in the prevailing discourse of any interest group and be able to check for irrelevant information, disinformation, distortion, hidden agendas and taboo areas (Dovers 2003).

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upper catchment are always divergent from those of the lower:

The agent must be able to achieve agreement on, and inculcate a negotiated understanding of sustainability.

Conclusion

This research has demonstrated the value of community-based networks in facilitating the creation of new knowledge in 'sub-political' arrangements. It showed that these networks, connected in various forms with corporations, can deliver the embeddedness, involvement, conflict resolution capacity and shared sense of relevance and purpose to enable the generation of new knowledge for sustainability. It has also led us to question the efficacy of 'sub-politics' in terms of the construction of knowledge 'from below'. Our results to date lead us to challenge Beck's assertion that these sub-political arenas will empower individuals and democratise decision-making through giving individuals a voice in new policies and knowledge (Beck 1995). Our research indicates the futility of multiple stakeholder arrangements, which offer inclusiveness through the participation of individuals, but little opportunity for intersections between multiple sources of information. As Beck himself has pointed out, the individualization processes of the post-industrial era can be equated to 'solitary-confinement', where individuals, through such sub-political arrangements as consultative committees are held responsible for decision-making on all sorts of issues, including the natural environment (Beck 1995: 40). Our results show that without the support of the community-based network, individual activists may indeed be in 'solitary confinement' in terms of any contribution to reflexive management practices. The individual does not have that same 'symbolic capital' or legitimacy that can be gained through association with an organization with reputational capital such as Landcare. As well, it is not only the structural embeddedness in multidirectional information flows which assists in the development of new knowledge for sustainability but a sense of shared relevance and purpose. Corporates and local communities are evidently struggling with the integrative aspects of sustainability and we saw that a reductive understanding of sustainability is one reason why Landcare is taken up so readily by corporate managers as a means of bridging to the community .

Overall, in the Landcare context of 'sub-politics' it does appear that out of the shared experience of solving a multitude of local environmental problems and linking them to the discourse of corporate sustainability new knowledge is being generated and reflected on.[6] The hope is that such reflexive management practices when transmitted will be slowly transmuted into a new global wisdom on sustainability. Wisdom is meaningful knowledge that has been widely tested and can be applied to prevent future problems (Dunphy and Pitsis 2003). It is this path from the accumulation of data

[6] In one example, the Hunter Regional Landcare group has prepared its own 114 page document on monitoring and evaluation of Landcare projects, currently under examination by the Hunter Catchment Management Trust.

through knowledge creation to developing a genuine store of new environmental wisdom that can form the focus of studies such as this in the future.

A number of areas requiring further research emerge from the results of this study. As Gray (2000) has pointed out, power relations are intrinsic to collaborative relationships. Our further research will examine power as a specific feature of knowledge-creation for sustainability in 'sub-politics'. One particular area of interest here would be the influence of the coordinators – do they work to leverage across structural holes (Burt 1992) and does this have any relationship to the creation of new knowledge and the capacity for reflexive management.

Another important area is the confusion between process and outcomes of 'sub-political' arrangements and the part that governments can play in alleviating this confusion. In our study, levels of government beyond the local council seemed to contribute little to informational flows which would enable the articulation of new knowledge We note from our results that many of the 'collaborative' decision-making arrangements are set up by government agencies, but who then take little part in adding to the information flows in order to foster reflexivity. As Jamison points out, governments do not find it easy to take the critical voices of community-based organisations and social movements seriously (Jamison 2000). Critics have labelled Landcare, for instance, as a 'neo-liberal' ploy (Lockie 1997). In further research we would address the question of whether politicians and technocrats in fact set the 'community' up for a failure in terms of outcomes – does this perspective on the part of government reflect the resistance of the institutions of industrial society to 'democracy from below', as Beck (1997) predicted would occur in the face of 'sub-political action ? In effect, by supporting the creation of 'sub-political' arrangements such as we observed, but not then contributing so as to foster their reflexive management, do they substitute process for outcome?

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RESULTS

Table 1.11 Centennial Coal – Newstan Mine (CCN)

Core business/ strategy	Underground mining company, mostly supplying government owned power generators.
Type of collaboration a)	Consultative committee - Newstan Committee
Depth of involvement	Community representation linked to long-standing relationship through Landcare; Landcare gives broad base for representation; multilevels of corporate involvement
Sense of purpose	Landcare Group's need for sponsorship; government requirement under terms of development consent; corporate licence to operate
Embeddedness	Multi-directional flow of information: company personnel represented on Landcare committee; small group of corporate employees involved in consultative committee; Landcare relations lead to in kind supply of equipment; organisation available through Landcare Coordinator; community network available for knowledge –based discussion.
Government involvement	Established the committee – otherwise uninvolved.
Other contributing stakeholders	Industry association and personnel from other mines assist in clarifying sustainability terms, peer discussion on tying sustainability down to specifics
Outcomes	Positive relations, exchange of information; in kind and financial assistance to Landcare; Landcare gives more permanency; knowledge creation in terms of Rivercare plans developed by Landcare with natural resource management knowledge input from CCN Environment Officer; training booklets for local council in OHS.
Evidence and method of new knowledge creation	Rivercare plans likely to be adopted by Hunter Catchment Management Trust and new knowledge thus to extend into a government agency – not site specific. Knowledge developed in OHS to do with revegetation and weed management, which is a product of on-ground experimentation across the network. CCN contributes to OHS knowledge generation only through general support and understanding of importance of OHS.
Barriers to knowledge creation	Defining sustainability in the context of a mining company's operations; competition between Landcare and conservation organisations for funding

Table 1.12 Centennial Coal - Mandalong Mine (CCM)

Core business	Underground mining company, mostly supplying government owned power generators.
Type of collaboration a)	Consultative committee - Mandalong Committee
Depth of involvement	Entrenched individuals from the community - 'not representative'
Sense of purpose	Government requirement ; corporate licence to operate
Embeddedness	Signs of "burn out" from the representatives of government organisations restrict input from government sources.
Other contributing stakeholders	Government required to communicate between corporation and community
Government involvement	Ongoing political demands - burn out. 'Six government departments get a letter a day'
Outcomes	Antagonistic relations; stalemate – committee to be disbanded in favour of an Open Forum
Evidence and method of new knowledge creation	Little evidence of new knowledge creation

Barriers to knowledge creation	Community perceptions: perceived corporate lack of transparency; corporate perceptions: political aim by community to end mining

Table 1.2 Ravensworth Operations (RO)

Core business	Open cut coal mining operations - diversified metal and mining multinational
Type of collaboration a)	Community Consultation Committee
Depth of involvement	Representatives from local councils and individuals nominated from the community by councils ; activist organisations (Minewatch)
Sense of purpose o	Corporate licence to operate given changing demographics in the area
Embeddedness	Corporate directed and uni-directional flow of information: corporation developed community plan provides for education; sponsorship of Landcare activities, quarterly corporate newsletter; little awareness of the value of local farming knowledge; little
Government involvement	Government departments are invited but rarely attend Consultation Committee; government more in a policing role
Other contributing stakeholders	Minerals Council conducts courses for teachers
Outcomes	Functional consultative relations, high uncertainty: unsure about the rehabilitation requirements beyond compliance due to ephemeral nature of community groups; no structural capacity for knowledge to be communicated beyond the corporate direction- not likely to benefit from the outsider critique; unidirectional information flow.
Evidence and method of new knowledge creation	The multiple stakeholder arrangement enables the dissemination of existing, established knowledge.
Barriers to knowledge generation	Non-permanent nature of community groups; Consultative Committee does not have access to the Landcare network; lack of relevant skills (or relevant level of expertise) of community members on the Committee.

Table 1.3 Hunter Water Corporation (HWC)

Core business	Water supply, sewage and stormwater company – government owned corporation
Type of collaboration	Consultative Forum; direct relationship with Landcare at regional and numerous local levels; Landcare Assistance Program in place
Involvement	Groups and individuals selected according to expertise and their capacity to represent a social group on the Forum; medium restricted interactions within HWC due to strong presence within HWC of an environmental leader
Sense of purpose	Develop trust and gauge public opinion to enable readier communication on corporate development and risk management; Corporate need to develop 'licence to grow' through establishing trust with community; HWC experts have difficulty in communicating with community people
Embeddedness	Focus groups, either issue or industry based, which are developed from the consultative forum; long established members of Forum (one member 22 years) have considerable contextual knowledge which they share on the Forum; Landcare carries out onground works at rehabilitation research projects to which HWC provides resources, including expertise; connected in networks with local councils, linked to numerous autonomous groups such as TidyTowns
Government involvement	Corporation involved with national problem-solving with 19 government agencies including National Parks agency; regulators tend to be reactive rather than proactive
Outcomes	Long term relationships – one member for 22 years; considerable store of local knowledge in the Forum which is seen as useful by the corporation; members invited onto the Forum because of their expertise. Government-owned corporation has an espoused vale of sustainability

Evidence and method of new knowledge creation	New practices in wetland rehabilitation being applied at Kooragang Wetland Research Project
Barriers to knowledge generation	Jobs need to be prioritised on the hierarchy of needs; no formal link to Landcare on the Consultative Forum; possibility of corporate capture of longstanding community members of Forum; Forum acts to collect information only; shallow interaction within HWC; need to balance the short and long term benefits of collaboration or consultative representation

Table 1. Rio Tinto (RT) Project Platypus[7]

Core business	International resources-based company
Type of collaboration	Jallikur Landcare Group - Landcare Coordinator and other research project needs funded by Rio Tinto
Involvement	Partnership Committee has 2 nominees from Landcare and 2 from Rio Tinto, most ongoing negotiations arranged through community consultants – medium involvement;
Sense of purpose	Develop community relations profile for Rio Tinto; scientific research on salinity issues conducted with assistance of Landcare Group, directed by Rio Tinto; deliverables required from the Landcare Group include evidence of scientific approach
Embeddedness	11 Landcare groups work with a number of v contributing stakeholders include Earthwatch Institute, volunteer conservation groups, local water authorities, government natural resource management departments, Rio Tinto environmental scientists visit sites twice per year; most community relations conducted by non-local consultants
Government involvement	Close working relationship with government natural resource management departments
Outcomes	Long term relationships but with a limited life– Landcare Group 10 years old – Project Platypus 5 year project continued on 2 years after Rio Tinto left area.
Evidence and method of new knowledge creation	Increased numbers of platypus in local rivers; some reduced sedimentation and erosion resulting from new practices in addressing salinity, publication on research into platypus health and habitat
Barriers to knowledge creation	Complex array of government authorities and voluntary organisations vying for Rio Tinto funding; lack of recognition given to local knowledge by Rio Tinto scientists; 'shallow' involvement by Rio Tinto; uncertain future commitment by Rio Tinto

Table 1.5 Westernport Water (WW)

Core business	Water authority in dairy farming area of Victoria
Type of collaboration	WW funds local Landcare organisation directly
Involvement	Farmers voluntarily join the Group; WW Managers attend meetings in work time; Landcare Coordinator partly funded by WW and attends meetings
Sense of purpose	WW needs high water quality for sustainable business development; farmers get interest free loans to build effluent ponds; restore land degraded by previous unsustainable farming practices
Embeddedness	Landcare Coordinator responsible for awareness-raising on sustainable farming – farms visits, assists in farm plans etc, organises experts; WW not involved in advice, university researchers who are local landowners; other water authorities in neighbouring shire; Edison Emission Energy (local energy company) funds Landcare projects; BHP (now BHP Billiton) funded projects have completed

[7] Research on Project Platypus was conducted in 2001.

Government involvement	Local government part funds Landcare Coordinator
Outcomes	Stable membership of long-lasting group (10 years); visible activity such as Landcare tree corridor construction and Landcare plant nursery raises awareness; more ongoing relationship with local companies while multinational corporations move on to higher visibility projects
Evidence and method of new knowledge creation	Landcare-run plant nursery develops new practices and knowledge about sequencing techniques of rehabilitation with provenance stock – knowledge and stock disseminated through its retail outlet.
Barriers to collaboration	Need for more accountability, ways of measuring sustainable farming and environmental improvement, limited relations with major corporates

Table 1.6 Trinature (TN)

Core business	Environmentally sound chemicals manufacturer using direct selling
Type of collaboration	Sponsorship of Landcare at the national level through Landcare Australia Ltd
Involvement	Distributors of the products are the front line
Sense of purpose	To build 2- way awareness p: to give Landcare access to Trinature's receptive membership and to develop credibility and a national profile for Trinature through sponsorship of flagship Landcare projects, building on Landcare's established reputation
Embeddedness	Focus on educating for environmental responsibility and precaution through Internet based dissemination of knowledge on environmentally sound chemistry; attempts to engage distributors as advocates in Landcare networks; partner company - environmentally responsible industrial chemicals firm
Government involvement	Little involvement or support
Outcomes	Local Landcare groups slow to participate in an arrangement negotiated at the national level of the Landcare organisation
Evidence and method of new knowledge creation	Working with existing knowledge – little evidence of new knowledge creation
Barriers to collaboration	Difficulty in collaborating with the national Landcare organisation; not effectively linked into Landcare networks; perception of Landcare as a top-down model; sponsorship only relationship; highly specialised nature of Trinature's product knowledge; uncertainty of 'best practice' qualities of products; lack of government support for enforcing higher sustainability standards in government procurement; employee burn-out; public distrust of a chemicals company purporting to conduct an environmental mission (chemicals seen as "taboo"?);

Table 2.1
Corporate perspective on factors influencing the development of new sustainability practices as a result of the multiple stakeholder arrangement

Factors	**Statements**

Finding a shared understanding of sustainability .	'The Minerals Council is highly engaged with sustainability. But it is still the environmental people talking. Sustainability is really community relations'.(CCN) 'Coal is going to stay. The driver to go beyond compliance (to sustainability issues) was peer driven - looking to the future security of what we do'. (CCN) 'Community expectations on mine rehabilitation vary greatly. Generally there is little knowledge of sustainability. Community people are happy to talk discharges and air quality, but sustainability is a major hurdle'. (CCN) ' Explaining to community members how a resources-based company can contribute to sustainability is hard' (CCM) 'The emphasis is on positive communication - moving past just the environmental area'(RO) 'Networks enable us to gauge public opinion' (HWC)
Extent to which a shared sense of purpose and of appropriate governance measures can be developed Extent to which information flow is multidirectional and incorporates local knowledge or is relevant to local understandings	'It is difficult to quantify collaboration because it is so hard to define'. 'Staff may only want to deal with community groups when they have to' (HWC) 'The most important driver is a shared sense of values - the current MD is an economist who is socially involved' (HWC) WW and Landcarers both think that accountability and specific measuring will be better' 'There is some internal staff resistance to collaboration - staff say "I'm an engineer, not a (community worker)"'. 'The dairy (neighbouring farm bought out as a result of ongoing protests by the farmers) is now running at a profit – we ran it according to good management practices' (RO) 'One problem area (of the community consultation committee) is determining the appropriate type of rehabilitation' (RO) 'We learnt a lot from Landcare about going from the corporate to the local level - in hindsight it would have been better (not to operate at the national level' (TN)
Extent to which relationship can move beyond conflict management (implications for demands on resources)	'Public participation requirements are out of control' (CCM). 'An ongoing issue is dealing with misinformation (by opposing companies) (TN)
Extent to which community representation and corporate 'spin' are perceived as legitimate by stakeholders	'It is all driven by politics'. ' 'The question is how to get adequate representation in community relations'. 'Consultative committees do not go back to the representative base' (CCM) 'TN is interested in sectoral alliances - but we need to secure surety of supply in circumstances where there is no watchdog organisation' (TN). 'Some concern has been expressed (by government regulators) about 'corporate capture' of the community representatives' (HWC)
Scope of government involvement	'Our relationships with government are not learning relationships' – CCN 'Over time, there is a tendency to allow the problem to(over) develop - the create the impression of crisis fixing which is good media image for the politicians' (HWC) "The Environment Protection Agency has not tried to help us - it has a police role - it is not a teaching relationship. The local council is more helpful and cooperative' (RO)

Table 2.2
Landcarers' perspectives on selected influence factors in Table 1

Factors	Statements

Finding a shared understanding of sustainability.	Landcare is currently being used to manage and monitor, because of the possibility of litigation risk to Council. Landcare needs to show to Council that they are well organized. Need to use manuals and other structured and systematic ways of dealing with knowledge development. Landcare is being used because of the structure established through the Lake Macquarie Network. 'We follow the HRLC sponsorship policy and reserve the right to withdraw from any project if the standards are dropping. The cost is losing our reputation'. 'There was a problem situation with Powercoal. We had a good relationship with them. But Landcarers had had land dropping and being washed away.' 'Landcare is not necessarily broadacre farming. Landcare is driven from the grass roots. Organisation X (local branch of an environmental advocacy organisation) is more into advocacy roles rather than onground works. The success of many of the groups in the Lake Macquarie area shows that urban Landcare can survive. The issues are basically the same with urban and rural Landcare'. "What government agencies call capacity building and the rest of us call education" (quote from Regional Landcare meeting)
Extent to which a shared sense of purpose and of appropriate governance measures can be developed	'Centennial Coal is really praiseworthy. Their environmental changes are wonderful. Paul Williams (Environmental Officer at CCN) is wonderful and there are no complaints at meetings'. 'When we say we want something they just give us the machinery'. 'The (Landcare) movement has maintained support because it entails very visible activity and people can see the changes' 'Landcarers are not recognised for their expertise. WW is now asking for a certain level of professionalism. Indicators are going to tighten up'.
Extent to which information flow is multidirectional and incorporates local knowledge or is relevant to local understandings	'Newstan Colliery Consultative Committee has been going for at least 3 years. It meets every three months. Resident complaints are transferred to the group'. 'One person on the Liaison Committee works for State Forests. This is a help because this person both lives and works in the area.' 'Bruce Petersen from Hunter Water (HWC) used to come to the meetings -he came to our opening'. ' The Committee was required because of land extension. Debra and John (Landcare Coordinators) applied because they had been involved through Landcare.' 'The coal company collaborates with the community but their people also live in the community'. 'Key sponsors are HWC. They tend to give small amounts of funding fro a number of community-based projects, particularly near catchment areas'. 'Asset Management department of the Local Council gave advice to landholders such as 'clean 3 m from your back fence - otherwise you have to leave it'. Now under the influence of Landcare they take a more holistic approach. John's (Landcare Coordinator's) computer is networked to Council and on a separate network. This cam about because John was originally housed in Council and had a lot of personal connections with people there'. 'Centennial Coal paid for Rivercare plan which can now be used to leverage government department money'. 'Landcare is the best linking group (on Port Phillip Island) 'Landcare provides the skills which Westernport Water needs' Landcare brings men and women together - other rural groups tend to be more gender discriminatory. Women make many decisions on the farm But the best thing is learning from each other'. 'Landcare has been successful because it requires people to come together to share and jointly solve a common problem. Farmers would have stood back if they had thought it to be a government initiative' 'Rio Tinto doesn't have much respect for Landcare as a source of scientific knowledge' "The Hunter Regional Landcare group has prepared its own 114 page document on monitoring and evaluation of Landcare projects, currently under examination by the Hunter Catchment Management Trust.

Extent to which relationship can go beyond conflict management (implications for demands on resources)	'The Mandalong Consultative Committee are largely sharefarmers - this may influence their behaviour on the committee. The subsidence effects of the mine were such that the creeks began to flow backwards. This is now happening to some of the creeks around Fassifern and the Newstan mine. A local conservation group has been trying to get resources for a decade and are now trying to move into Landcare to get Landcare resources. They say 'we want to help you', sponsor Landcare groups to get funding then dump them'.
Extent to which community representation and corporate 'spin' on consultation are perceived as legitimate by stakeholders	'Our houses started to shake at night. Underground mining had been causing massive vibrations which went for months. Houses cracked and there was little compensation. Many committees were formed as a result. A situation was forced whereby properties were examined before mining began. The company was Oceanic Coal - 'the coal mine canvassed but did not inform'.
Scope of government involvement	